

STATE OF MAINE  
PUBLIC UTILITIES COMMISSION

Docket No. 2004-521

April 1, 2005

Maine Model Building Energy Code

ORDER PROVISIONALLY  
ADOPTING RULE

WELCH, Chairman; DIAMOND and REISHUS, Commissioners

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**I. SUMMARY**

In this Order, the Maine Public Utilities Commission (Commission) provisionally adopts Chapter 920 – Maine Model Building Energy Code, a major substantive rule that will establish a Maine Model Building Energy Code, as required by P.L. 2003 ch. 645.

**II. BACKGROUND**

A. Building Codes Established by Law in 2004

During its 2004 session, the Legislature enacted two laws, P.L. 2003, ch. 580 (Building Code Act), codified as 10 M.R.S.A. §9701-§9706, and P.L. 2003, ch 645 (the Energy Code Act), codified in part as 35-A M.R.S.A. §121, that changed building code requirements in Maine. The Building Code Act establishes a variety of building codes, but does not establish energy codes. The Energy Code Act sets forth a procedure for adopting energy codes and establishes parameters that govern the codes.

The Building Code Act contains the following requirements:

- Maine's building codes shall be the International Residential Code® (IRC) and the International Building Code® (IBC), which define standards in such areas as building design, construction material, and fuel burning systems.<sup>1</sup>
- Each municipality shall decide whether or not to adopt building codes, but if it adopts codes, it must adopt the IRC and the IBC. The municipality may amend portions of the codes as long as it does not adopt a different code in its entirety.
- Codes currently required by law supersede conflicting portions of the IRC or IBC (for example, fire safety, electric, and plumbing codes).

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<sup>1</sup> The IBC and IRC are members of a larger family of codes called the I-Codes. The I-Codes are developed by the International Code Council (ICC), an organization that establishes widely-used, comprehensive building standards. I-Codes may be obtained through ICC's web site: <http://www.iccsafe.org> or may be viewed in the Commission's library.

- A building code already adopted by a municipality is grandfathered.

The Energy Code Act contains the following requirements:<sup>2</sup>

- Maine's energy codes shall be "consistent with any other model building code adopted by the State."
- The Commission shall determine Maine's energy codes through a major substantive rulemaking.
- Maine's codes must include ventilation standards.
- Each municipality shall decide whether or not to adopt energy codes, but if it adopts codes, it must adopt the energy codes established by the Commission.
- Maine's energy codes must not be inconsistent with fire, plumbing, and certain other related codes.
- An energy code already adopted by a municipality is grandfathered.

B. Building Energy Codes in Existence before 2004

Other provisions of Maine law contained in 10 M.R.S.A. Chapter 214, enacted before 2004 and still in effect, govern energy efficiency standards that must be attained by building construction in Maine:

- New construction and substantial renovation of multifamily structures and commercial or institutional buildings must conform to ASHRAE 90.1-2001 energy requirements and ASHRAE 62-2001 ventilation standards.<sup>3</sup> The Energy Code Act deems compliance with the 2003 version of the International Energy Conservation Code® (IECC) to constitute compliance with this law.<sup>4</sup>
- Publicly subsidized, multifamily, residential housing heated with electricity must attain minimum R-values established in Maine law.<sup>5</sup>

Before 2004, Maine law required residential spec-built homes to attain prescribed R-values, but the Energy Code Act repealed that provision as of 90 days after the adjournment of the First Regular Session of the 122nd Legislature.<sup>6</sup> At that time, the

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<sup>2</sup> The Energy Code Act also requires the Commission to investigate enforcement models. The Commission submitted its findings, "Investigation of Building Code Compliance and Enforcement Methods," to the Legislature on December 31, 2004.

<sup>3</sup> ASHRAE is the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., an organization that establishes widely-used building standards. The standards may be found at ASHRAE's web site, [www.ashrae.org](http://www.ashrae.org).

<sup>4</sup> 10 M.R.S.A. §1415-C(3) and §1415(D).

<sup>5</sup> 10 M.R.S.A. §1415-G.

<sup>6</sup> Approximately September, 2005.

terms of the major substantive rule developed through this rulemaking will become effective.

C. Commission Inquiries

On May 14, 2004, the Commission opened Docket No. 2004-260, an Inquiry to obtain information about issues to be resolved in the Maine Model Building Energy Code rulemaking. The Commission sent notice of the Inquiry to over 250 persons and trade associations involved with building codes or energy efficiency, including the long-standing statewide Building Code Working Group that includes members of virtually all interested organizations, and to a comprehensive distribution list of municipal officers and code enforcement officials. The Maine Indoor Air Quality Council, Maine Municipal Association, Northeast Energy Efficiency Partnership, and Responsible Energy Codes Alliance submitted written comments. The Commission held a technical conference in June 2004, which was attended by persons representing the American Institute of Architects, American Plastics Association, Associated Constructors of Maine, ASHRAE, Central Maine Power Company, Home Builders and Remodelers Association of Maine, International Association of Plumbing and Mechanical Officials, Maine Indoor Air Quality Council, Maine Oil Dealers Association, Maine Municipal Association, Maine State Housing Authority, Modular Home Builders Association of Maine, Manufactured Housing Board, Maricor Group, Northeast Energy Efficiency Partnerships, National Fire Protection Association, Northern Utilities, Office of Professional and Financial Regulation, and Office of the Public Advocate.

In an earlier inquiry (Docket No. 2003-690), the Commission obtained information to assist in developing a report on building energy codes required by P.L. 2003, ch. 497. The Commission received written comments and held a public hearing, obtaining input from many stakeholders in addition to those mentioned in the previous paragraph. In January, 2004, the Commission issued its report, "Final Report on Building Energy Codes."

D. Rulemaking

On September 2, 2004, the Commission issued a Notice of Rulemaking and a proposed rule, Chapter 920 - Model Building Energy Code (Docket No. 2004-521). The proposed rule was based on comments we received in the two earlier Inquiries and information we learned throughout the two-year period. The Notice was sent to all persons who participated in or received notice of the earlier Inquiries and all organizations of which the Commission was aware, that represented persons, businesses, or government functions affected by building construction.

Interested persons submitted written comments by October 1, 2004. The Commission held a public hearing on October 6, and final written comments were submitted by October 27, 2004. The American Society of Heating, Refrigerating and Air-

Conditioning Engineers, Inc. (ASHRAE), the Building Codes Assistance Project (BCAP),<sup>7</sup> Douglas Richmond Architects, Home Builders and Remodelers Association of Maine (HBRA), Maine Department of Environmental Protection (DEP), Maine Indoor Air Quality Council (MIAQC),<sup>8</sup> Maine Oil Dealers Association (MODA), Modular Homebuilders Association of Maine (MHBA), Nancy Artz, and the Responsible Energy Codes Alliance (RECA)<sup>9</sup> submitted written comments. ASHRAE, HBRA, Maine Building Officials and Inspectors Association (MBOIA), MIAQC, MHBA, Northeast Energy Efficiency Project (NEEP), and Office of the Public Advocate (OPA) spoke at the public hearing, and others attended.

### III. ORGANIZATION OF THE RULE

We received some comments that led us to re-examine the extent to which the wording of the proposed rule clearly expressed its intent. We concluded that, in some cases, the rule appeared to incorrectly state that its terms are mandatory for certain construction (in particular, residential construction). This is inappropriate because each municipality may choose whether to adopt the model code for residential construction. This re-examination led us to conclude that the wording was also somewhat misleading in other ways. We have re-worded the provisional rule to remove terms that were misleading or inaccurate.

### IV. DISCUSSION OF RULE PROVISIONS

#### A. Purpose (Section 1)

Section 1 describes the purpose of the Chapter, which is to define the components of Maine's Model Building Energy Code for building construction, as required by the Building Code Act. In the provisional rule, we adopted a suggestion made by HBRA to change the phrase we used in the proposed rule ("Model Energy Code"), to avoid confusion with the Model Energy Code family of codes that is already well established in Maine and other states.

#### B. Definitions (Section 2)

Section 2 contains definitions of terms used in the rule. The definitions generally fall into two categories. First, they define the national building energy and ventilation standards established by ASHRAE and the ICC, which the rule adopts in whole or in part. The IECC sets forth construction practices that impact building envelope

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<sup>7</sup> BCAP also represents the Alliance to Save Energy, American Council for an Energy-Efficient Economy, and Natural Resources Defense Council.

<sup>8</sup> MIAQC is an interdisciplinary cooperative of professionals formed to promote the improvement of all indoor air environments in the state.

<sup>9</sup> RECA is a consortium of energy efficiency professionals, product and equipment manufacturers, and trade associations with expertise in building energy codes.

thermal performance, mechanical heating, air-conditioning, water heater and other mechanical system efficiency, and lighting efficiency. The IRC's Chapter 11 and the IBC's Chapter 13 set forth construction practices in these areas for residential and commercial construction respectively. ASHRAE 62-2001 sets forth ventilation standards that result in adequate air exchange within all types of buildings, but primarily emphasizes commercial building standards. ASHRAE 62.2-2003 focuses on ventilation standards in residential buildings.

The second category contains definitions of various types of buildings – residential, commercial, industrial, and modular. These definitions are derived from Maine law or from the relevant ICC or ASHRAE standards. In the proposed rule, when definitions in Maine law differed from those in the national standards, the rule generally used the definition in the national standards because this definition would result in internal consistency within the codes and consistency with other states, as well as minimize confusion within the building and enforcement community. When the Legislature considers the provisionally adopted rule, the Commission will propose the statutory revisions necessary to attain consistency between the provisional rule and Maine law.

In the proposed rule, the derivations of certain definitions were as follows:

- Residential: *Established in the I-Codes*. 10 M.R.S.A. §1413 currently establishes a slightly different definition, an inconsistency that the Commission will address through proposed legislation. The four categories of residential housing set forth in the I-Codes<sup>10</sup> are described in the I-Codes literature generally as follows:
  - i. detached homes, set forth in Section R101.2 of the IRC;
  - ii. townhouses, set forth in Section R101.2 of the IRC;
  - iii. apartment houses, boarding houses, convents, monasteries, rectories, fraternities, sororities, dormitories, and rooming houses, set forth in the definition of Group R-2 residential buildings in the IECC; and
  - iv. residential care and assisted living facilities with more than five but not more than 16 occupants, set forth in the definition of Group R-4 residential buildings in the IECC.
- Commercial: *Generally established in IECC definitions, Section 101.2 of the IECC and Section 2.3 of ASHRAE 90.1*. The I-Codes and ASHRAE consider commercial buildings to be all those that are not residential, but limit some standards to portions of non-residential buildings that are not associated with manufacturing operations. 10 M.R.S.A. §1413 uses the term “commercial or institutional” to mean all buildings that are not

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<sup>10</sup> The comparable definition in the ASHRAE 62.2-2003 Standards appears to differ slightly.

residential or industrial. The proposed rule did not retain the term “or institutional” because it appeared to be superfluous.

- Industrial: Established in 10 M.R.S.A. §1413. The definition in the proposed rule simplified, but was similar in intent to, the definition in Maine law. The definition was consistent with the intent of the I-Codes and ASHRAE, although they do not explicitly define industrial buildings.
- Modular housing: Established in 10 M.R.S.A. §9002(7).

MODA noted the omission of a definition of “IBC-2003,” and we have added that definition to the provisional rule. Other definitions are unchanged in the provisional rule.

MIAQ suggested adding the titles of each ASHRAE standard, and we have done so in the provisional rule.

C. Standards Comprising the Maine Model Building Energy Code (Section 3(A))

1. National Energy Standards. Section 3(A) establishes that, except as modified elsewhere in the rule, the Maine Model Building Energy Code shall consist of the energy efficiency components of the I-Codes and ASHRAE standards (i.e., Chapter 11 of the IRC, Chapter 13 of the IBC, the IECC, and ASHRAE standard 90.1) and the ventilation components of the ASHRAE standards (i.e., ASHRAE standards 62-2001 and 62.2-2003).<sup>11</sup>

Adopting the I-Codes complies with the Energy Code Act’s requirement that the energy codes be consistent with the building codes established in the Building Codes Act. Adopting ASHRAE 90.1 and ASHRAE 62-2001 is consistent with existing law at 10 M.R.S.A. §1415-D. In its written comments, HBRA disagreed with the inclusion of the ASHRAE 90.1-2001 standard in the model code, but did not give reasons for its objection. Because ASHRAE 90.1-2001 is required by Maine statute, we decline to remove it from the provisional rule. RECA and BCAP recommended the adoption of the approved 2004 addenda to ASHRAE 90.1-2001, and in particular Addendum G, which improves the lighting requirements and makes those requirements consistent with the IECC lighting standards. We decline to adopt this suggestion as well. Although we believe that we have the option of adopting an ASHRAE 90.1 version that differs from the law and recommending to the Legislature that it revise the statute accordingly, we are hesitant to do so at this time. Adoption of the 2001 version of ASHRAE 90.1 is more aggressive than many states require, and we find it preferable to improve the understanding and enforcement of the code we do have before attempting to improve it. In

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<sup>11</sup> The Commission has made these standards available in its library at 242 State Street, Augusta.

the future, we expect that Maine law and this rule will be revised to incorporate more current versions of all the standards.

BCAP, RECA, MIAQC, and others commended the decision to adopt the IECC and the ASHRAE standards. MBOIA endorsed adoption of the I-Codes, commenting that consistency statewide was desirable, that Maine's towns are moving toward the I-Codes, and that some of Maine's code officials are actively involved in code development. Nancy Artz supported energy efficiency standards that are as stringent as possible, commenting that society will benefit from improved environmental impacts and other effects. Richmond Architects also supported efficiency and ventilation standards and recommended they be performance-based to allow flexibility in compliance.

In comments in the rulemaking, no party supported adopting an efficiency code other than the I-Codes or ASHRAE 90.1, and some commented that the I-Codes are becoming well-established across the nation, are developed through a thorough stakeholder process, and are reasonable standards for the industry to follow.

HBRA emphasized that standards must be cost-effective, and submitted an estimate, made by the Maine State Housing Authority, that increasing the cost of an \$80,000 house by \$1,000 would make the house affordable by 2,500 fewer people. HBRA estimated that the cost of insulating to the codes as published in the basic tables would be from \$2,600 to \$3,500 above common practice and that the incremental cost of a high efficiency propane furnace would cost between \$375 and \$550. At the public hearing, the HBRA representative asserted that he did not object to energy codes per se, but objected to "how far they go." On the other hand, the DEP asserted that the IECC-2000 standards would provide 46.9 million metric tons of carbon dioxide emission reductions by 2020 at a cost-effectiveness of minus \$46 per ton – i.e., consumers would save \$46 for every ton of CO<sub>2</sub> reduced. RECA commented that the IECC will cost-effectively save on utility bills, and Nancy Arntz commented that the code would benefit consumers through long-term positive payback. Cost-effectiveness studies (in particular, a study performed in Maine by R. J. Karg Associates and two studies from Michigan and Nebraska submitted by RECA) were submitted during the Inquiries and support the contention that energy codes save consumers money by reducing energy costs over the long run.

The DEP commented that the Maine Greenhouse Gas Initiative identified residential building energy codes as a preferred strategy for addressing greenhouse gas emission and the U.S. EPA recently endorsed using building codes as a strategy for meeting various Clean Air Act air quality standards.

HBRA has commented on a number of occasions that the Building Code Act implicitly adopted an energy and ventilation code because it adopted Chapter 11 of the IRC. This view would apparently suggest that a Maine Model Building Energy Code and this rulemaking are not needed. We disagree, for if that were the case, the Legislature would not have enacted the Energy Code Act. Chapter 11 of the IRC and the IECC are

not in conflict, as the HBRA appears to think. Indeed, the I-Codes are developed as a family of codes that are intended to be used together.

In the provisional rule, we revised the presentation in Section 3(A), to respond in part to HBRA's comment that Sections 3(A) and 3(B) were confusing when taken together.

2. Versions of the IECC. The most current version of the IRC and IECC were developed in 2003, but were revised through a supplemental process during 2004. The 2004 Supplement became available in late July. To our knowledge it has not been adopted in any state.

In the Notice of Rulemaking, we stated that the 2003 versions of the IRC and IECC have been adopted in seven states, and the substantially similar 2000 version has been adopted by 19 states (although some states modify portions). Thus, the contents of the 2003 version are widely understood, and problems and impacts are well identified. We stated that the 2004 Supplement significantly improves the usefulness of the standards by removing a variety of complexities that have impeded their adoption.<sup>12</sup>

The proposed rule adopted the 2003 version of the I-Codes, rather than the 2004 Supplement, and we sought input on whether this approach was the most appropriate. We stated that it would be confusing to train builders and code officials in codes that may soon become out-of-date and that simplifications made in the 2004 Supplement were strongly supported by HBRA. However, nationally developed training materials and widely-used software tools may not become available for a few years, and the 2004 Supplement has not been used in the field, where problems will be discovered and solutions considered. Indeed, some stakeholders in other states believe that there are a substantial number of problems in the Supplement, and that the next iteration of the standard will contain many revisions. Finally, in recent years, the State Planning Office has sponsored the development of training materials, software tools, and training sessions that are now available to builders.<sup>13</sup> These materials are based on (but do not precisely contain) the 2000 version of the IRC and IECC, and would thus be useable with minimal revisions if the 2003 version were adopted as Maine's model code. Using other states' models, Maine could introduce some of the improvements in the 2004 Supplement, thus making the Maine Model Building Energy Code more useable in the field than would be the case with a pure adoption of the 2003 version.

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<sup>12</sup> The two most relevant revisions are: (1) lowering the number of Maine climate zones from 3 confusing zones to 2 easily-recognized zones and (2) removing the need to combine the climate zone and glazing percentage when determining applicable standards.

<sup>13</sup> The State Planning Office hired R. J. Karg Associates to develop this material and conduct training. R. J. Karg Associates may be reached at 220 Meadow Road, Topsham, Maine 04086, 207-725-6723, and at [www.karg.com](http://www.karg.com).



RECA recommended adopting the 2004 Supplement because it includes vast improvements and simplifications suited for Maine and is simple enough to be easily implemented (RECA commented that the 2003 edition is “an acceptable code option for Maine”). HBRA (which, early in our Inquiries, supported the 2004 Supplement) was concerned that aspects of the supplement would be problematic to carry out and would be changed in future versions of the code. HBRA contended that certain simplifications contained in the 2004 Supplement would make the code easier to follow with minimal sacrifice in efficiencies. We discuss these and others’ views on simplification, and our decision regarding them, in Section II(D) below.

3. National Ventilation Codes. Section 3(A) establishes that the ventilation components of the Maine Model Building Energy Code shall be ASHRAE standard 62-2001 and ASHRAE standard 62.2-2003. In its written comments, HBRA disagreed with the inclusion of the ASHRAE 62-2001 standard in the model code. Because ASHRAE 62-2001 is required by Maine statute, we decline to remove it from the provisional rule.

The proposed rule proposed the adoption of ASHRAE 62.2-2003 for residential dwellings as defined in the rule. In the Notice of Rulemaking, we stated that the ASHRAE 62.2-2003 ventilation standard has not yet been adopted throughout the region, so its impact on air quality, building cost, and building practices is untested and Maine’s builders would have less regional knowledge upon which to rely. We noted that, in our Inquiries, some local stakeholders stated that ASHRAE 62.2’s requirements to build mechanical ventilation into the house would be costly and unnecessary, and some claimed that homeowners create adequate ventilation by opening windows without mechanical intervention. We stated our initial view that ASHRAE 62.2-2003 appeared to be relatively flexible, allowing a choice of options for compliance. For example, it allows compliance through bathroom or kitchen fan controls, which are not unusually costly, or through an air-to-air heat exchanger. We stated that it is unlikely that homeowners are aware of the amount of ventilation necessary to avoid mold and other indoor pollutants in their own homes. Furthermore, the law requires the adoption of an indoor air quality standard, suggesting that the Legislature believes that current building and homeowner practices are not adequate.

Because ASHRAE 62.2 has undergone a multi-year, well-respected peer review process nationally, is the only nationally developed ventilation code targeted specifically to residential buildings,<sup>14</sup> and appears to be more flexible than many detractors claim, we included it in the proposed rule. A decision not to include any residential ventilation code did not seem justifiable under the Energy Code Act. Stakeholders are generally in agreement that, as buildings become “tighter,” mold and air quality become problems, and builders are reportedly taking steps to become more familiar with construction solutions to this problem.

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<sup>14</sup> Some states (Vermont is an example) have developed their own ventilation code.

The ASHRAE Code Interaction Subcommittee of the ASHRAE Standards Committee endorsed the adoption of the 62.2-2003 standard. It commented that the 62.2 standard is the first nationally recognized indoor air quality standard developed solely for homes. The Subcommittee noted that the standard requires whole house ventilation, but accomplishes it through local mechanical exhaust in kitchens and bathrooms. This approach removes pollutants at their source, before they enter the remainder of the house – one reason why local exhaust accomplishes whole-house results.

HBRA objected to the ASHRAE 62.2-2003 standard, commenting that no state has adopted it. HBRA suggested that, if the rule includes any ventilation code, it include ASHRAE 62-1989, which HBRA asserted is consistent with the IRC and IECC. We share HBRA's concern that ASHRAE 62.2-2003 is new and unproven. However, the ASHRAE standard has undergone a lengthy peer review that complies with ANSI standards, is the only nationally recognized ventilation standard that focuses solely on residential construction, and is highly likely to be adopted by other states as time goes by. Thus, we decline to adopt the 1989 version of the ASHRAE ventilation code.

HBRA appeared to assert that today's houses receive adequate outside air for infiltration and that bathroom exhaust fans are currently common practice. On the other hand, according to the ASHRAE Subcommittee, while many building professionals believe windows and leaky building envelopes provide sufficient ventilation, research shows that pollutants can be two to five times greater indoors than outdoors. HBRA commented that there is no evidence that the fact that a fan is quieter improves its use, and asserts that kitchen range hoods are ineffective in removing moisture and odors and are problematic in apartments and townhouses. We continue to be skeptical that homeowners know the appropriate length of time to engage their bathroom fans, and common sense suggests that homeowners are more likely to use quieter fans (and fans that are mechanically programmed for appropriate usage, as required by the ASHRAE standard). We also have no basis upon which to judge whether houses are "adequately leaky" to allow adequate air exchange, especially if higher efficiency levels are attained because of code adoption.

HBRA recommended that the IECC and IRC codes should govern moisture control and ventilation. However, MIAQC asserted that IECC-2003 is weak in the area of indoor air quality, lacking any direct references to air quality or specific air leakage or ventilation rates. The ventilation provision of the IRC (Section R303.1) allows natural ventilation through openings that can be controlled by the occupants or, alternatively, mechanical ventilation at levels specified in the section. It appears to us that this section is too limited to be considered a "standard," and thus does not adequately comply with the statutory requirement to adopt ventilation standards.

MIAQC commented that mold and indoor pollutants can pose serious health hazards to homeowners, that Maine has among the highest asthma rates in the country, and that health and safety issues must be considered as part of any decision

regarding adoption of a statewide building code. MIAQC asserted that energy conservation efforts can compromise indoor air quality, but that a proper balance between energy efficiency and indoor air quality may be achieved if best practice guidelines are followed, specifically (within the context of this rulemaking) the ASHRAE ventilation standards.

MODA suggested adopting a standard that has been used for a longer period of time while further analyzing the impacts of the ASHRAE standard in Maine. While reference to other standards was made from time to time during our Inquiries, no commenter has put forth another standard for consideration. Thus, we continue to believe that the ASHRAE standard is the premier model among any approaches used by other states.

HBRA estimated the cost of house ventilation to be from \$700 to \$1,000 (approximately \$350 for local exhaust fans and \$350 - \$700 for back drafting tests on the furnace and water heater) and the cost of air distribution systems to be \$3,000 or more. MIAQC commented that the health and safety of building occupants should never be sacrificed due to expense, and estimated that the incremental cost of the higher quality, quieter fans necessary to provide whole house mechanical ventilation is \$200 to \$500. HBRA contended generally that there are no large-scale studies substantiating the need for or the effectiveness of the measures required by ASHRAE 62.2.

We conclude that the cost of house ventilation is reasonably low compared to the health benefits that may be attained by the standards. For most houses, the cost to comply with the ASHRAE standard is the incremental cost of quieter bathroom and kitchen fans that operate mechanically rather than at the discretion of the occupant, measurable in the hundreds (not thousands) of dollars, not the higher cost of whole-house air-to-air exchange systems. This added cost is a small percentage of the overall construction cost. While comments by HBRA indicated a pervasive impression that the higher-cost systems are required by the standard, our Staff indicates that the more costly air-to-air heat exchange system would be required rarely if ever. We believe that, as builders become familiar with the ASHRAE requirements, they will discover that relatively inexpensive changes to common practice (i.e., the installation of high-efficiency, quiet fans) will allow compliance in most homes.

HBRA commented that the extent to which back draft testing is performed, and the adequacy of the tests used, are unknown. That harmful air composition can result from inadequate back drafting, and that this problem is exacerbated when a house is tightened to attain efficiency are of great concern to us. It is one reason we have rejected suggestions that we adopt a simplified ventilation table and instead adopt the full version of ASHRAE 62.2-2003. As we comment elsewhere, at this time, we must trust the professionals who install furnaces and water heaters to perform any tests necessary to ensure the safety of those living in the home.

The appropriate ventilation standard to adopt is the most difficult issue in this rulemaking. Parties to the rulemaking who commented on this issue generally held two opposing views. Some (e.g., HBRA) believe that no standards are necessary, standards would cause serious financial harm, and standards are extremely difficult to understand. Others (e.g., MIAQC) believe that ASHRAE 62.2 is necessary to avoid serious health and safety harm, especially as homes become tighter to improve energy efficiency. During the comment period, no commenters offered proposals that suggested a compromise between these positions.

We are concerned that we will risk an outcome in which homebuilders do not fully understand and accept (and thus not comply with) the ventilation code. During the public hearing, the HBRA representative expressed confusion and skepticism regarding the extent to which kitchen and bath fans could accomplish whole-house ventilation as required by the standard. In other comments, the representative made it clear that adapting the baseline table (Tables 4.1a and 4.1b) appropriately was confusing. The ASHRAE representative confirmed that builders are responsible for determining that the proper air exchange rate is met in the house.

It appears to us that the ASHRAE 62.2 requirements are not overly complex or costly. There is a single table, Table 4.1a, that determines the appropriate fans in a relatively straightforward way, with a simple algebraic formula that compensates for household size. Requirements associated with furnace back draft testing are common practice and should not pose undue difficulty. However, we recognize that the one person representing builders in our proceeding did not agree with our assessment.

During the public hearing and afterward, we explored simplifications to the ventilation code similar to those we adopted for the IECC energy codes (discussed in the following section of this Order). We considered allowing builders to conform to Table 4.1a, without incorporating other factors in the standard such as number of household members and furnace back drafting tests. It was our hope to develop a prescriptive requirement that did not require builders to measure the effect of the equipment they installed. However, based on our own knowledge, we cannot conclude that such simplification maintains an adequate level of safety for homeowners. In particular, removing the considerations associated with furnace back drafting appears to be unwise and unsafe. Thus, in the provisional rule, we retain the provision in the proposed rule that adopts ASHRAE 62.2-2003 in full for all residential new construction. We believe it would be valuable if a group could develop a prescriptive formula for compliance; however, we were unable to do so.

Thus, it is critically important to the success of this code that MIAQC, HBRA, ASHRAE and others find ways to educate homebuilders and code officials so that the standards may easily and effectively be introduced into Maine's building practices. As discussed in the public hearing, educating practitioners on ways to judge the effect of their measures (measured in air exchanges in the whole house) must be emphasized.

Finally, the proposed rule required compliance with ASHRAE 62.2-2003 during new construction, but not during renovation. It was our view that to require the installation of compliant bathroom and kitchen fans when a homeowner performed renovations that were unrelated to those rooms would be onerous and unacceptable to homeowners. In its comments, MIAQC explored ways that ASHRAE 62.2 compliance could reasonably be applied during renovations to existing buildings. MIAQC recommended an “interim approach” that would require the installation of local exhaust ventilation during renovations that involve a kitchen or a bathroom, compliance with ASHRAE 62.2-2003 during substantial renovations (as currently defined in law), and a best practice recommendation for ASHRAE 62.2-2003 compliance whenever significant building tightening is performed. We appreciate MIAQC’s effort to balance public acceptance with indoor air quality goals. We are inclined to think that the interim suggestion is an effective one. However, representatives of the building community view adoption of ASHRAE 62.2-2003 with such disapproval that we are hesitant to add an even stricter requirement. Thus, in the provisional rule, we require the 62.2 standard only for new construction, as was the case in the proposed rule. We encourage all those who offer training in ventilation procedures to emphasize best practices that include compliance with ASHRAE 62.2-2003 whenever feasible.

We reiterate that, especially during the first year of code implementation, training of Maine’s builders and code officials will be vitally important to the success of code implementation. DEP commented on this subject, recommending that education and outreach, as well as financial incentives such as efficiency mortgages, would enhance the effectiveness of the codes. We urge all affected entities to keep this point in mind in the coming year, and to avail themselves of training assistance that has been offered by MIAQC, HBRA, State agencies, and others.

**D. Modifications and Simplifications to the Energy Code (Section 3(B))**

The IRC and IECC standards are more stringent than some, but not all, practices followed by many residential builders in Maine. For example, the basic ceiling insulation standard (R-49) and wall insulation standard (R-21) exceed common practice, and some stakeholders assert that building materials are not available to comply with these standards.<sup>15</sup> However, the IRC and IECC have been adopted in other northern states<sup>16</sup> (e.g., New Hampshire, Vermont, New York, Wisconsin, Montana, and Washington) that contain climate zones similar to Maine’s. Our investigations suggest that builders in those states are obtaining materials and constructing homes in compliance with the standards that would be applicable in Maine. In addition, there are builders in Maine

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<sup>15</sup> In some areas, the IRC and IECC are less stringent than common practice. For example, Maine homes commonly use 82%-84% efficient oil burners, a level which is above the IRC/IECC requirement of 78% efficiency.

<sup>16</sup> Because standards vary by climate zone, it is appropriate to consider other northern states whose climate zones are similar to Maine’s when judging the effectiveness and practicality of the standards.

who construct homes that meet or exceed the standards established in the I-Codes. Thus, we see no reason why builders in Maine should experience undue difficulty once the codes have become established and understood. Indeed, consistency across the northern tier of states should lower product costs from manufacturers who make regional deliveries.

Having drawn this initial general conclusion, we note that some (not all) states have adopted revisions to the residential I-Codes, to avoid the practices that are particularly unpalatable to builders. In addition, most states provide tools that make compliance simpler for builders who do not wish to avail themselves of the full flexibility available through the I-Codes. Such actions seem reasonable, especially in light of the fact that the I-Codes are new to the residential building community. However, while exploring simplifying approaches, our initial belief is that, to the greatest extent possible, Maine should avoid “watering down” the codes and thereby diminishing the value to consumers of efficient homes.

In Section 3(B) of the proposed rule, we included three simplifications to the I-Codes that we thought showed promise in Maine.

1. Simplified Climate Zones. Section 3(B)(1) is modeled after a New Hampshire practice and is consistent with changes made in the 2004 Supplement. It reduces the number of climate zones prescribed by the 2003 versions of the I-Codes to two easily identified zones (one zone is Aroostook county, where weather is colder on average than in the rest of Maine; the second zone comprises the rest of Maine). This revision occurs in the 2004 Supplement, so our view is that adopting it at this time simply hastens the implementation of a decision that was already made through the ICC peer review process.

BCAP and HBRA supported this simplification and we adopt the two zone simplification in the provisional rule.

RECA and BCAP objected to (and HBRA questioned) the choice of climate zones 14 and 16 as the two simplified zones, noting that these zones are typical of more southerly zones than are appropriate for Maine. The proposed rule specified these two zones erroneously. Our intent was to specify zone 15 (which includes most of southern Maine) and 17 (which includes most of northern Maine) as the simplified zones. The provisional rule corrects this error.

2. Simplified Table to Avoid Glazing Calculation. Section 3(B)(2) is modeled after an approach adopted in Pennsylvania and is consistent with a change made in the 2004 Supplement to simplify the code. It deems any residential building to be compliant with the code if it follows the requirements of a building with 15% glazing.<sup>17</sup> The

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<sup>17</sup> The IECC-2003 and IRC-2003 standards are different depending on the percentage of the home that is comprised of windows. This approach is reasonable, because significant

IECC-2003 contains requirements that vary at different glazing percentages, and a builder may still use the IECC tables. However, Section 3(B)(2) allows a builder who does not wish to calculate glazing percentage (a calculation that has apparently caused confusion as to interpretation and resulted in inconsistent outcomes) to construct a compliant home using a single simple table. In the Notice of Rulemaking, we stated that, in our view, this approach is reasonable because most homes are built with 15% or less glazing. The relatively few homes built with higher than average window area would (if the builder chooses to use the simple 15% table) be less efficient than the IECC specifies, but this outcome might be more than offset by the benefit of more widespread acceptance of the code.

3. Simplified Trade-off Table to Allow Common Practice. Section 3(B)(3) is modeled after a practice followed in other states. It adopts simplified prescriptive tables showing standards that comply with the I-Codes but that do not include requirements that are most objectionable to segments of the building community (e.g., R-49 insulation in the ceiling). The tables are created using the so-called trade-off method contained in the I-Codes, through which a builder may lower the efficiency of one building component by improving the efficiency of another component. In all other northern states we contacted, builders routinely perform trade-off analysis using the *REScheck*® computer software developed by the Department of Energy to avoid the requirements that they find most difficult to attain. In some states, including New Hampshire, Vermont, New York, Massachusetts, and Pennsylvania, a state agency publishes the result of one or more commonly used trade-off tables, to ensure that builders may easily find a way to construct a compliant residential home.

Section 3(B)(3) of the proposed rule required the Commission to produce such tables and to adopt them as part of the rule. The tables adopted the two simplifications discussed earlier, and presented three compliant packages, each representing a trade-off analysis that lowered one or more provision of the I-Code standards that we have been told may be difficult to attain. Adopting the tables by rule would guarantee that there is one published standard that builders can rely upon to be compliant everywhere in the State<sup>18</sup> (in municipalities that adopt standards).

HBRA strongly supported this approach, commenting that the simplified tables would make compliance possible and understandable, and suggesting that the simplified tables be presented first in the rule. We have not made this change in the provisional rule. However, we anticipate that most written training materials will likely focus on the simplified tables and, when providing training to its members, HBRA is free to emphasize the simplified tables.

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amounts of heat are lost through glazed surfaces. However, it adds complexity to the standards, and the 2004 Supplement removes the differentiations.

<sup>18</sup> Because there are two climate zones in Maine, there are two sets of standards in the State as a whole.

RECA and BCAP commented that the simplified tables do not maintain energy efficiency levels consistent with the IECC requirements. RECA noted that similar changes made in the 2004 Supplement were coupled with safeguards and improvements that were designed to complement the removal of glazing complexities, commenting that making some changes but not others would compromise the efficiency of the code. We agree that many houses (e.g., those with higher glazing surface and those with higher wall-to-ceiling ratios) will be less efficient if built according to the simplified tables. However, for home structures most commonly built in Maine, the simplified tables will produce efficiency levels that “pass” the IECC test. We continue to believe that the benefit of providing codes that are acceptable to and easily implemented by the building community is crucial to the success of energy codes in Maine.

In addition, RECA objected to trading off long-lasting envelope measures for relatively short-lived mechanical equipment, as the simplified tables did. RECA commented that a homeowner only gets one chance to properly insulate, but will get four or more chances to install an efficient heating system (whose efficiency is improving in part because of federal mandates to do so). Thus, consumers would be better served by requiring the envelope efficiency levels prescribed by the IECC. We appreciate RECA’s intention to maintain codes that are as efficient as possible under all circumstances. However, we continue to believe that the simplification will make the code more acceptable and understandable to builders and code officials, and thus make it more likely that the code will be followed. Thus, we retain this simplification in the provisional rule.

The IECC and IRC require, as a minimum, a 78% - 80% efficient furnace or boiler. Furnaces with an efficiency of 82%-84% are readily available and widely used in Maine, and higher-efficiency models are obtainable. Thus, the table includes 82% - 86% efficient furnaces and boilers to attain efficiency that is lost by relaxing ceiling or wall insulation requirements, while retaining one package in each zone that accommodates a lower efficiency model. BCAP asserted that these “mid-efficiency” heating units can produce acidic condensate that is not appropriately removed, leading to unsafe deterioration of the unit. BCAP recommended that the tables encourage “high efficiency” heating equipment with AFUE of 90% or better, which BCAP claims is readily available in gas-fired condensing units.

We are informed that units with this efficiency level are commonly used in Maine. Indeed, the simplified tables will be acceptable to most builders partly for this reason. We assume that the professionals who install heating units are skilled in applying appropriate safety practices. The fact that fuel systems are installed by persons licensed for this purpose provides reassurance that the systems will be installed safely. Thus, we consider BCAP’s concerns to be outside the scope of this rulemaking.



The table's requirements regarding insulating basements<sup>19</sup> drew a considerable amount of discussion among commenters. Many commented that significant heat loss occurs because basements are not insulated and that relaxing the I-Codes' requirement to insulate to the floor of the basement would sacrifice significant efficiency. MIAQC commented that incomplete foundation insulation will also cause surface condensation, leading to excess moisture and mold growth in summer months and the possible installation of finish surfaces that would further encourage mold. At the public hearing, the ASHRAE representative reiterated this concern. BCAP and MIAQ commented that using proper backfill and drainage techniques during construction would avoid frost damage to the home's foundation. MIAQC presented comments from seven building science professionals supporting this assertion. In the public hearing, HBRA expressed concern that insulating to only 4 feet (as proposed by the proposed rule) would not allay homebuilders' fears of frost damage. The HBRA representative described proper drainage and backfill as a "first line of defense" and expressed the desire to retain the "second line of defense" offered by warm external walls. However, HBRA asserted that full wall insulation is probably the proper approach to take, and homebuilders in Maine should become informed on how to safely accomplish it. The MBOIA representative asserted that the IBC and the IRC require proper foundation drainage, and the ASHRAE representative discussed ways to avoid frost damage.

We conclude that the "compromise" of leaving portions of the basement wall uninsulated is not an effective way to allay fears of frost damage. Furthermore, it was not clear from comments whether the practice would, in actual practice, reduce the risk of frost damage. It is clear, however, that the proposal would worsen the indoor air quality of the basement by increasing the likelihood of excessive moisture. Thus, in the provisional rule, the simplified table requires insulation to the floor of a conditioned basement, as is required by the I-Code standards.

In the public hearing and in the MIAQC written comments, interested persons also discussed the wisdom of requiring insulation inside vs. outside the basement walls. Opinions varied, and we have not added any explicit reference to the topic in the provisional rule. Thus, the I-Codes govern this practice.

Finally, BCAP commented that the simplified table contains no requirement for insulation of crawl space walls or floors, essentially removing any efficiency requirement for these surfaces. BCAP claimed that could cause significant deterioration in the building's efficiency. We agree, and have added to the simplified table requirements for those two surfaces. The requirements are those contained in the IECC standards – R-21 for floors and R-20 for crawl space walls.

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<sup>19</sup> Insulating a conditioned basement is not widely practiced in Maine. Many builders believe basement insulation creates an unacceptable risk of frost damage to the home foundation, and indeed stories of frost damage are easy to find. The simplified table in the proposed rule would have allowed uninsulated space below the frost line, to allay concerns regarding frost damage.

The simplified table sought to avoid the R-49 ceiling insulation required by the I-Codes. R-49 ceiling insulation is not common practice in Maine, requires a structural change to accomplish, is often not acceptable to homebuilders, and has been circumvented in other states through various means. The simplified table required R-38 in the ceiling in most instances and attained offsetting efficiencies elsewhere in the home. Although some New England states allow R-30 in a cathedral ceiling, our initial preference was to encourage R-38 and R-49 in ceiling construction. We received no comments on ceiling insulation specifically, and the provisional rule remains unchanged in this regard.

The simplified table sought to avoid the R-21 wall insulation required by the I-Codes, because R-21 wall insulation is not common practice in Maine. R-21 insulation does not require a structural change to accomplish, would be readily available if builders wished to buy it, and would add less than \$200 to the cost of a typical home. Therefore, we initially believed that this standard was reasonable and should be adopted. We received no comment on the likelihood of whether R-21 insulation would be accepted and used by builders, so the provisional rule remains unchanged in this regard by including packages with R-19 and R-21.

In the provisional rule, we revised the wording of the terms of the rule to better reflect the intent of the proposed rule, which is to adopt the tables as part of the rule.

E. Applicability (Section 4(A))

1. Residential buildings. Section 4(A)(1) specifies that the model code would apply to all residential buildings as defined in the national standards.

Until recently, Maine law limited residential construction standards to so-called spec-built homes (i.e., the law exempted single-family residences built by or for the owner to be his/her own residence).<sup>20</sup> The standards adopted through the I-Codes apply to “detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress and their accessory structures”<sup>21</sup> as well as certain groups of dwellings whose occupants are essentially permanent.<sup>22</sup> The proposed rule applied standards (in municipalities that adopt standards) to all residential building types that are covered by the I-Codes, not simply to spec-built homes. This approach would retain consistency with the nearby states that

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<sup>20</sup> 10 M.R.S.A. §1415-C(2)(A), effective until 90 days after the adjournment of the First Regular Session of the 122nd Legislature.

<sup>21</sup> Section R101.2 of the 2003 IRC manual. The I-Codes exempt from building envelope standards buildings that are separated from the remainder of the building, that have low design energy use, or that are neither heated nor cooled (see Section 101.2.1 of the 2003 IECC manual).

<sup>22</sup> Definitions of residential building, groups R-2 and R-4 in the IECC manual.

have adopted the IRC and IECC,<sup>23</sup> and should be convenient for builders who work across state lines and for stores that make regional purchases. It would also result in energy efficiency for a far larger portion of Maine's homes than is currently the case. We received no comment on this provision, and the provisional rule remains unchanged in this regard.

A recently repealed Maine law<sup>24</sup> also exempted log homes from standards compliance. The proposed rule did not exempt log homes from the applicability requirement, and we received no comment on the topic, so the provisional rule remains unchanged in this regard.

2. Commercial buildings. Section 4(A)(2) incorporates the requirements of 10 M.R.S.A. §1415-D, which require that any new commercial construction must conform to ASHRAE Standard 62-2001 ventilation standards and to ASHRAE 90.1-2001 or IECC-2003 efficiency standards. Unlike Section 4(A)(1), this section does not include reference to voluntary adoption by municipalities, because Maine law requires that all commercial buildings comply with the code, regardless of the municipality's adoption decision. An exemption for renovations that are not "substantial," specified in section 1415-D, is referenced later in the proposed rule.

3. Industrial buildings. The standards of 10 M.R.S.A. §1415-D apply to commercial (and institutional) buildings, and explicitly do not apply to industrial buildings. However, the IECC efficiency standards and the ASHRAE efficiency and ventilation standards apply to portions of industrial buildings that are occupied for non-industrial purposes, such as offices and cafeterias.<sup>25</sup> In the Notice of Rulemaking, we stated that the approach taken by the IECC and ASHRAE standards is reasonable and appears to be consistent with the intent of 10 M.R.S.A. §1415-D. Thus, Section 4(A)(3) of the proposed rule applied the same efficiency and ventilation standards to non-industrial, occupied portions of industrial buildings that it applied to commercial buildings. We received no comments on Section 4(A)(2) and the provisional rule remains unchanged in this regard.

The proposed rule allowed municipalities to choose whether to adopt the Maine Model Building Energy Code for non-industrial portions of industrial buildings. Because Maine law specifies mandatory codes only for commercial buildings and the Energy Act specifies voluntary adoption of codes generally, it appears that the rule must allow voluntary adoption of codes in industrial buildings. Treating occupied portions of industrial buildings in the same way that commercial buildings are treated might be a more consistent approach that is advantageous for builders and building owners alike. We

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<sup>23</sup> New Hampshire and Vermont building energy codes are based upon recent versions of the I-Codes. Massachusetts building energy codes are based on somewhat older versions of the I-Codes.

<sup>24</sup> 10 M.R.S.A. §1415-C(2)(B), effective until 90 days after the adjournment of the First Regular Session of the 122nd Legislature.

<sup>25</sup> Section 101.2 of the IECC refers to "those portions of factory and industrial occupancies designed primarily for human occupancy."

received no comment on this issue and the provisional rule remains unchanged in this regard.

4. Manufactured (including modular) housing. Section 4(A)(4) of the proposed rule exempted modular housing from the requirements of the Maine Model Building Energy Code. In the Notice of Rulemaking, we stated that, in our view, there is no reason to exempt modular housing from the code as a matter of energy policy. Modular housing accounts for a significant portion of all new residential construction in Maine.<sup>26</sup> However, section 9042 of the Manufactured Housing Act (10 M.R.S.A. §9001-§9090) explicitly exempts manufactured housing from “all state or other political subdivision codes, standards, rules or regulations” that regulate matters for which the Manufactured Housing Board has established standards. It was our view that this provision effectively exempted modular housing construction from the code adopted by the Commission and the codes adopted by individual municipalities. We stated that we hoped the Board decides to adopt the IRC-2003 and IECC-2003<sup>27</sup> (indeed, section 9042 requires that the Board “adopt standards in conformance with nationally recognized standards”).

Richmond Architects commented that energy codes should apply to manufactured housing because these homeowners deserve the benefit of energy efficiency and indoor air quality. In the Inquiry, NEEP echoed this comment, while recognizing that research must be conducted into statutory jurisdictional provisions.

In our Inquiries and at the public hearing, MHBA noted that, because modular homes are manufactured in bulk at central facilities and are intended to offer a lower-cost alternative to stick-built homes, it is necessary to maintain consistent requirements within a state and, ideally, across the country. Establishing standards through a central Board removes the difficulty that would be caused by the fact that some municipalities may adopt the model code and others may retain different, pre-existing codes. MHBA also commented that applying the Maine Model Building Energy Code to modular housing results in unequal treatment between the modular and stick-built industry. Because adoption of energy codes is voluntary, only a portion of stick-built homes would be required to conform to the code. However, because modular homes are built to consistent standards statewide, adoption of energy codes would result in all modular homes conforming to the code.

In the rulemaking, MHBA submitted a summary of standards that govern construction by most modular builders in the eastern United States, asserting that

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<sup>26</sup> We have received estimates ranging from 25% to 50%.

<sup>27</sup> The I-Codes do not explicitly address modular and manufactured homes. Three types of manufactured housing are defined in the Maine Manufactured Housing Act: “HUD-code homes” or “newer mobile homes;” “modular homes” that are manufactured according to Maine’s Manufactured Housing Act; and units constructed prior to mid-1976. Building standards established by the U.S. Department of Housing and Urban Development (HUD) govern the construction of HUD-code homes and pre-empt Maine standards.

the modular industry currently follows standards that are more stringent than the I-Codes. It appeared to us that the construction standards followed by many of these manufacturers are less stringent than those in the IECC-2003 and IRC-2003 basic tables, although some companies provide a high-efficiency option. The standards are often consistent with the simplified tables proposed in the proposed rule if high-efficient furnaces are installed. Since a modular home is sold without the furnace installed, it is impossible to guarantee that the occupied home will comply with the Maine Model Building Energy Code proposed in the provisional rule, although the MHBA representative asserted that furnace efficiencies were typically in the range published on the simplified tables.

In its comments, MHBA asserted that, currently, building energy codes are suspended for newly constructed modular homes delivered to Maine. MHBA stated that the Board will consider the appropriate codes to adopt when this rulemaking is complete. At the public hearing, the MHBA representative opined that there is no reason that modular homes should not be held to the same standards as other homes.

We continue to believe that Maine's home buyers will be best served if modular housing complies with energy codes that are as efficient as those deemed appropriate through this rule for other housing. MHBA comments at the public hearing, as well as the fact that many manufacturers build to these standards, lead us to believe that, in general, these standards are no more onerous or costly for modular builders than for all other builders.

State law exempts manufactured housing from the need to comply with state codes, *when codes on the same issues have been established by the Board*. When the Board has not established codes (as is the case now, during a transition between the previous codes and future codes to be developed), we are uncertain of the application of the statute. With this in mind, the provisional rule requires modular housing to comply with the Maine Model Building Energy Code if no comparable code has been developed by the Board.

F. Types of construction (Section 4(B)).

1. New construction (Section 4(B)(1)). Section 4(B)(1) states that all new construction shall comply with the requirements of the standards.<sup>28</sup>

2. Additions, alterations, renovations, and repairs (Sections 4(B)(2), 4(B)(3) and 4(B)(4)). The IECC states: "Additions, alterations, renovations or repairs to a building envelope, mechanical, service water-heating, electrical distribution or illumination system or portion thereof shall conform to the provisions of this code as they relate to new

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<sup>28</sup> 10 M.R.S.A. §1415-G establishes building envelope standards for publicly subsidized, multifamily, residential housing when the housing builder has been given permission by a State agency to install electric heat. We have no reason to recommend revision to this law, and have not referred to it in the proposed rule.

construction without requiring the unaltered portions(s) of the existing system to comply with all of the requirements of this code.”<sup>29</sup> The IRC and IBC provisions are similarly worded.<sup>30</sup> The IECC further states that additions, repairs and alterations may comply with the International Existing Building Code, which we have not studied.

In the Notice of Rulemaking, we stated that adopting the I-Codes approach would improve Maine's existing building stock over time but that we could imagine many repair situations in which compliance could be onerous. Other states take varying approaches to this problem. However, we noted that additions (addressed in Section (B)(2) in the provisional rule) appear to fall into three general categories: unconditioned areas such as mudrooms, specialty areas such as sunrooms, and living space that is a structural extension of the house. The IECC-2003 contains an exemption for unconditioned space that would allow mudrooms and breezeways to be exempt from code compliance, which we consider reasonable.<sup>31</sup> The IECC-2003 contains unique requirements for sunrooms that minimize inefficiency of the sunroom while protecting the remainder of the house from reduced efficiency.<sup>32</sup> New Hampshire has adopted the sunroom provisions explicitly in its regulations. The IECC requires additions that simply extend the size of the house to comply with code, which seems reasonable to us. Thus, the proposed rule required that additions comply with the requirements of the I-Codes because the codes appeared to be reasonable for all types of additions. We received no comments on this provision as it regards energy standards and the proposed rule remains unchanged in this regard. In our earlier discussion of Section 3(A), we discussed comments we received regarding ventilation standards in additions. The provisional rule does not require additions to comply with the ventilation standards of the Maine Model Building Energy Code. The provisional rule places additions in a separate provision (Section 4(B)(2)) to allow this clarification.

Alterations, renovations, and repairs are far more problematic because they include a wide range of unique situations. Some states exempt all repairs<sup>33</sup> from energy code requirements. Other states adopt the I-Codes with no exemptions. Maine law exempts from compliance commercial building renovation whose cost does not exceed 50% of the value of the building, thereby limiting compliance to “substantial” renovations. In the proposed rule, we rejected the approach of exempting all residential repairs from compliance, and we did not include a “size” limiter because it did not seem to be effective in addressing instances that would be problematic. New Hampshire and Massachusetts require some level of code compliance for repairs. Consistency among New England states will be advantageous for contractors and will encourage regional stores to stock code-compliant material. Thus, we included in the proposed rule exemptions for residential buildings that have been adopted in New Hampshire. These

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<sup>29</sup> Section R101.2.2.2 of the 2003 IECC manual.

<sup>30</sup> Section R101.2 of the 2003 IRC manual and Section 101.2 of the 2003 IBC manual.

<sup>31</sup> Section 101.2.1.2 of the IECC.

<sup>32</sup> Section 502.2.5 and table 502.2.5.

<sup>33</sup> We use the term “repairs” to include renovations and alterations.

exemptions appear to us to avoid the most unreasonable practices that might be required to conform to code (e.g., changing the structure of the home or replacing the entire window structures when the glass breaks), while retaining reasonable efficiency practices (such as adding insulation when a wall cavity is opened). We received no comments on this provision as it regards energy standards, and the terms of the provisional rule (now in Section 4(B)(3)) remains unchanged in this regard. Earlier in our discussion of Section 3(A), we discussed comments we received regarding ventilation standards for alterations, renovations, and repairs. The provisional rule does not require such construction to comply with the ventilation standards of the Maine Model Building Energy Code.

Section 4(B)(4) adopts the exemption from compliance for commercial buildings that is contained in 10 M.R.S.A. §1415-D.

3. Change of occupancy (Section 4(B)(5)). The IRC, IBC, and IECC require that a building be retrofitted to meet code when a change of occupancy is accompanied by an increase in the demand for fossil or electric fuel.<sup>34</sup> Adopting this approach would improve Maine's existing building stock over time. However, it is our view that the general public would find this requirement to be extremely onerous, and that enforcement would likely be difficult or impossible. Thus, Section 4(B)(5) of the proposed rule removed this requirement from the Model Energy Code. We received no comments on this provision and the provisional rule remains unchanged in this regard.

G. Other Codes and Standards (Section 5). The Energy Code Act requires that the Commission "ensure that the model code is not inconsistent with any other applicable state code or standard, including, but not limited to, any fire safety code, plumbing code, oil and solid fuel equipment standard, propane and natural gas equipment standard or boiler and pressure vessel standard."<sup>35</sup> These codes are contained in Maine statutes or formulated by boards that are established by Maine law to oversee their respective industries, and usually fall under the auspices of Maine's Department of Professional and Financial Regulation (DPFR).

In many other states, stakeholder groups carry out a detailed review of all state codes and the relationship of the codes to one another. The review often takes years. Such a review has not occurred in Maine, and was not done through this rulemaking. Maine's policy makers must weigh the impact of delaying the adoption of efficiency codes against the risk that inconsistencies will make implementation unduly difficult. We see no significant harm in proceeding with code adoption and allowing stakeholders to consider problems and their solutions as they arise in practice. Any serious conflicts that arise can be addressed through the waiver section of the rule. Thus, the proposed rule adopted the approach taken in the Building Codes Act and stated that, if the Maine Model Building Energy Code conflicts with any existing standard listed explicitly in Section 5 of the proposed rule, the existing standard shall apply.

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<sup>34</sup> Section 101.2.2.3 of the IECC.

<sup>35</sup> 10 M.R.S.A. §121(1).

MODA supported this approach, commenting that it will take time to determine whether there are conflicts or inconsistencies between the energy code and existing licensing codes. MODA felt that the provisions of the proposed rule provided clarity during this time. The provisional rule is unchanged in this regard. As with other sections of the rule, we have made wording changes to improve accuracy.

We note that in Maine, no single State agency or stakeholder organization is responsible for decisions regarding all building codes. The State Planning Office furnishes training, the Commission may, if requested by the Legislature and provided with adequate resources, provide advice on energy codes, and DPFR has a role to play when functions that it regulates are affected. However, absent the creation of a central building codes agency, local building code officials and builders will often have to deal with questions and conflicts (if any) based on their experience and judgment.

H. Adoption Provisions (Section 6)

1. Voluntary vs. Mandatory Adoption. The Building Code Act and the Energy Code Act establish a “voluntary” code adoption model, in that they allow each municipality to choose whether to adopt codes.<sup>36</sup> Section 6 of the rule re-states this provision of the laws.

2. Existing Adopted Codes. Both Acts grandfather existing municipally adopted building codes,<sup>37</sup> and the rule restates this provision in Section 6.

I. Interpretations (Section 7). The I-Codes organization has procedures that allow builders to obtain interpretations of the terms in the standards, but there is no single agency within the State that is responsible for decisions regarding building codes. Section 7 of the proposed rule specified that a person may request an advisory opinion of the Commission regarding interpretation of any standard, and we have retained that provision in the provisional rule.

J. Amendability (Section 8). While the Building Code Act allows a municipality to adopt only portions of the IRC or IBC and to amend the codes it adopts (subject to some limitations), the Energy Code Act is silent on this issue.

Allowing municipalities to amend their codes might cause a greater number of them to adopt the Maine Model Building Energy Code. However, if municipalities amend the model code, builders and suppliers, as well as entities assisting in enforcement

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<sup>36</sup> The term “voluntary” does not mean that an individual builder or homeowner may choose whether to comply with codes. A municipality decides which codes to adopt (if any) and all construction within that municipality must conform to the codes chosen.

<sup>37</sup> 35-A M.R.S.A. §121 of Title 35-A and 10 M.R.S.A. §9702.



or training, would not experience the benefits of consistency that are a primary reason for adopting a statewide model code.

To address this issue, the proposed rule incorporated in Section 8 the Commission's standard language for waivers of provisions of the rule provided that the waiver is not inconsistent with the rule's purposes or with statutory provisions. This would allow a municipality to request that the Commission grant an exemption from a term in the Maine Model Building Energy Code. We would not be inclined to do so absent a demonstrable, substantive showing that the municipality should receive such an exemption.

In the public hearing, MBOIA asserted that a municipality should be able to amend the code, but only upon a strong showing of good cause to some entity such as the Commission. MMA has, on many occasions, stated its strong opinion that municipalities must retain the ability to amend the code based on their own unique local situations. In our view, the language in Section 8 strikes an appropriate balance between municipal flexibility and a control mechanism to ensure statewide consistency. Thus, the language in the provisional rule remains unchanged.

Accordingly, we

#### O R D E R

1. That the attached rule is hereby provisionally adopted.
2. That the administrative Director shall submit the provisionally adopted rule and related materials to the Legislature for review and authorization for final adoption.
3. That the Administrative Director shall notify the following of this Order:
  - a. All transmission and distribution utilities in the State;
  - b. All persons who have filed with the Commission within the past year a written request for Notice of Rulemaking;
  - c. All persons who have requested with the Commission to be notified of activities in this proceeding or who commented in the Docket 2003-697, 2004-260, or 2004-521; and
  - d. All organizations of which the Commission is aware that represent persons, businesses, or government functions affected by building construction.
4. That the Administrative Director shall send copies of this Order Approving Provisional Chapter 920 to:

- a. The Office of the Attorney General;
- b. The Secretary of State, pursuant to 5 M.R.S.A. §8072(1); and
- c. The Executive Director of the Legislative Council, 115 State House Station, Augusta, Maine 04333-0115 (20 copies).

Dated at Augusta, Maine, this 1st day of April, 2005.

BY ORDER OF THE COMMISSION

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Dennis L. Keschl  
Administrative Director

COMMISSIONERS VOTING FOR:      Welch  
   Diamond  
   Reishus